

Christoph Kirchlechner

List of Publications by Year in descending order

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107
papers

3,258
citations

136950

32
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189892

50
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108
all docs

108
docs citations

108
times ranked

2582
citing authors

#	ARTICLE	IF	CITATIONS
1	Strategies for damage tolerance enhancement in metal/ceramic thin films: Lessons learned from Ti/TiN. Acta Materialia, 2022, 228, 117777.	7.9	22
2	Size scaling in bi-crystalline Cu micropillars containing a coherent twin boundary. Acta Materialia, 2022, 230, 117841.	7.9	3
3	Influence of strain rate on the activation of {110}, {112}, {123} slip in ferrite of DP800. Materialia, 2021, 15, 100983.	2.7	6
4	The fracture toughness of martensite islands in dual-phase DP800 steel. Journal of Materials Research, 2021, 36, 2495-2504.	2.6	8
5	Orientation-dependent plastic deformation mechanisms and competition with stress-induced phase transformation in microscale NiTi. Acta Materialia, 2021, 208, 116731.	7.9	31
6	Quantitative insights into the dislocation source behavior of twin boundaries suggest a new dislocation source mechanism. Journal of Materials Research, 2021, 36, 2037-2046.	2.6	6
7	Grain boundary formation through particle detachment during coarsening of nanoporous metals. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	7.1	7
8	On the fracture behavior of Cr ₂ AlC coatings. Materials and Design, 2021, 206, 109757.	7.0	10
9	Faceting diagram for Ag segregation induced nanofaceting at an asymmetric Cu tilt grain boundary. Acta Materialia, 2021, 214, 116960.	7.9	12
10	Electrical and mechanical behaviour of metal thin films with deformation-induced cracks predicted by computational homogenisation. International Journal of Fracture, 2021, 231, 223-242.	2.2	5
11	Electronic structure based design of thin film metallic glasses with superior fracture toughness. Materials and Design, 2020, 186, 108327.	7.0	13
12	Effects of transformation-induced plasticity on the small-scale deformation behavior of single crystalline complex concentrated alloys. Scripta Materialia, 2020, 176, 122-125.	5.2	5
13	On the mechanical heterogeneity in dual phase steel grades: Activation of slip systems and deformation of martensite in DP800. Acta Materialia, 2020, 183, 274-284.	7.9	71
14	In situ observations of single grain behavior during plastic deformation in polycrystalline Ni using energy dispersive Laue diffraction. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2020, 772, 138778.	5.6	3
15	Crystal structure and composition dependence of mechanical properties of single-crystalline NbCo ₂ Laves phase. Acta Materialia, 2020, 184, 151-163.	7.9	29
16	Dislocation-induced breakthrough of strength and ductility trade-off in a non-equiatomic high-entropy alloy. Acta Materialia, 2020, 185, 45-54.	7.9	76
17	Efficient characterization tools for deformation-induced damage at different scales. Production Engineering, 2020, 14, 95-104.	2.3	6
18	Size dependent strength, slip transfer and slip compatibility in nanotwinned silver. Acta Materialia, 2020, 184, 120-131.	7.9	23

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19	Dislocation plasticity and detwinning under thermal stresses in nanotwinned Ag thin films. Acta Materialia, 2020, 198, 61-71.	7.9	2
20	Atomistic deformation behavior of single and twin crystalline Cu nanopillars with preexisting dislocations. Acta Materialia, 2020, 197, 54-68.	7.9	20
21	How tensile tests allow a screening of the fracture toughness of hard coatings. Surface and Coatings Technology, 2020, 390, 125645.	4.8	10
22	Experimental conditions affecting the measured fracture toughness at the microscale: Notch geometry and crack extension measurement. Materials and Design, 2020, 191, 108582.	7.0	30
23	Thin-Film Microtensile-Test Structures for High-Throughput Characterization of Mechanical Properties. ACS Combinatorial Science, 2020, 22, 142-149.	3.8	13
24	Does the stacking fault energy affect dislocation multiplication?. Materials Characterization, 2020, 161, 110136.	4.4	10
25	Variable-Wavelength Quick Scanning Nanofocused X-Ray Microscopy for In Situ Strain and Tilt Mapping. Small, 2020, 16, 1905990.	10.0	3
26	Dislocation plasticity in FeCoCrMnNi high-entropy alloy: quantitative insights from <i>in situ</i> transmission electron microscopy deformation. Materials Research Letters, 2020, 8, 216-224.	8.7	35
27	Development of a high-temperature micromechanics stage with a novel temperature measurement approach. Review of Scientific Instruments, 2019, 90, 073904.	1.3	1
28	In situ study on fracture behaviour of white etching layers formed on rails. Acta Materialia, 2019, 180, 60-72.	7.9	38
29	How close can indents be placed without risking an erroneous pop-in statistics?. Materialia, 2019, 7, 100378.	2.7	9
30	Micro fracture investigations of white etching layers. Materials and Design, 2019, 180, 107892.	7.0	24
31	Impact of in situ nanomechanics on physical metallurgy. MRS Bulletin, 2019, 44, 465-470.	3.5	12
32	Au-Sn solders applied in transient liquid phase bonding: Microstructure and mechanical behavior. Materialia, 2019, 8, 100503.	2.7	7
33	Synthesis and mechanical testing of grain boundaries at the micro and sub-micro scale. Materialprüfung/Materials Testing, 2019, 61, 5-18.	2.2	10
34	Influence of composition and crystal structure on the fracture toughness of NbCo ₂ Laves phase studied by micro-cantilever bending tests. Materials and Design, 2018, 145, 116-121.	7.0	24
35	Overview on micro- and nanomechanical testing: New insights in interface plasticity and fracture at small length scales. Acta Materialia, 2018, 142, 248-282.	7.9	268
36	Microstructure and mechanical properties in the thin film system Cu-Zr. Thin Solid Films, 2018, 645, 193-202.	1.8	10

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37	Segregation-Induced Nanofaceting Transition at an Asymmetric Tilt Grain Boundary in Copper. <i>Physical Review Letters</i> , 2018, 121, 255502.	7.8	40
38	Dislocation slip transmission through a coherent $\{111\}$ copper twin boundary: Strain rate sensitivity, activation volume and strength distribution function. <i>Acta Materialia</i> , 2018, 161, 412-419.	7.9	41
39	Nano-laminated thin film metallic glass design for outstanding mechanical properties. <i>Scripta Materialia</i> , 2018, 155, 73-77.	5.2	23
40	On the nature of twin boundary-associated strengthening in Fe-Mn-C steel. <i>Scripta Materialia</i> , 2018, 156, 27-31.	5.2	30
41	Fracture toughness of Mo ₂ BC thin films: Intrinsic toughness versus system toughening. <i>Materials and Design</i> , 2018, 154, 20-27.	7.0	38
42	In-situ observations of the fracture and adhesion of Cu/Nb multilayers on polyimide substrates. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2018, 735, 456-462.	5.6	19
43	Microstructural and mechanical characterization of an equiatomic YGdTbDyHo high entropy alloy with hexagonal close-packed structure. <i>Acta Materialia</i> , 2018, 156, 86-96.	7.9	58
44	Effect of annealing on the size dependent deformation behavior of thin cobalt films on flexible substrates. <i>Thin Solid Films</i> , 2017, 624, 34-40.	1.8	7
45	Dislocation-twin boundary interaction in small scale Cu bi-crystals loaded in different crystallographic directions. <i>Acta Materialia</i> , 2017, 129, 91-97.	7.9	51
46	Dislocation interaction and twinning-induced plasticity in face-centered cubic Fe-Mn-C micro-pillars. <i>Acta Materialia</i> , 2017, 132, 162-173.	7.9	41
47	Thickness dependence of the electro-mechanical response of sputter-deposited Mo thin films on polyimide: Insights from in situ synchrotron diffraction tensile tests. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2017, 697, 17-23.	5.6	36
48	Strain rate dependence of the slip transfer through a penetrable high angle grain boundary in copper. <i>Scripta Materialia</i> , 2017, 138, 88-91.	5.2	23
49	Compressed Bi-crystal micropillars showing a sigmoidal deformation state – A computational study. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2017, 700, 168-174.	5.6	0
50	Microcantilever Fracture Testing of Intermetallic Cu ₃ Sn in Lead-Free Solder Interconnects. <i>Journal of Electronic Materials</i> , 2017, 46, 1607-1611.	2.2	4
51	Size effect in bi-crystalline micropillars with a penetrable high angle grain boundary. <i>Acta Materialia</i> , 2017, 129, 312-320.	7.9	57
52	Pre- and post-buckling behavior of bi-crystalline micropillars: Origin and consequences. <i>Acta Materialia</i> , 2017, 124, 195-203.	7.9	18
53	Microstructural influence on the cyclic electro-mechanical behaviour of ductile films on polymer substrates. <i>Thin Solid Films</i> , 2017, 644, 166-172.	1.8	22
54	Fracture behavior of nanostructured heavily cold drawn pearlitic steel wires before and after annealing. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2017, 707, 164-171.	5.6	22

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55	On the influence of microcantilever pre-crack geometries on the apparent fracture toughness of brittle materials. <i>Acta Materialia</i> , 2017, 136, 281-287.	7.9	53
56	Mechanical size effects in a single crystalline equiatomic FeCrCoMnNi high entropy alloy. <i>Scripta Materialia</i> , 2017, 129, 52-55.	5.2	46
57	Stress intensity factor dependence on anisotropy and geometry during micro-fracture experiments. <i>Scripta Materialia</i> , 2017, 127, 76-78.	5.2	36
58	Single-shot full strain tensor determination with microbeam X-ray Laue diffraction and a two-dimensional energy-dispersive detector. <i>Journal of Applied Crystallography</i> , 2017, 50, 901-908.	4.5	13
59	Superlattice effect for enhanced fracture toughness of hard coatings. <i>Scripta Materialia</i> , 2016, 124, 67-70.	5.2	128
60	Electronic hybridisation implications for the damage-tolerance of thin film metallic glasses. <i>Scientific Reports</i> , 2016, 6, 36556.	3.3	26
61	Effect of Microstructure on the Electro-Mechanical Behaviour of Cu Films on Polyimide. <i>Jom</i> , 2016, 68, 1640-1646.	1.9	15
62	The effect of size on the strength of FCC metals at elevated temperatures: annealed copper. <i>Philosophical Magazine</i> , 2016, 96, 3379-3395.	1.6	28
63	Coccospheres confer mechanical protection: New evidence for an old hypothesis. <i>Acta Biomaterialia</i> , 2016, 42, 258-264.	8.3	26
64	Electro-mechanical performance of thin gold films on polyimide. <i>MRS Advances</i> , 2016, 1, 773-778.	0.9	13
65	Strain-induced phase transformation of a thin Co film on flexible substrates. <i>Acta Materialia</i> , 2016, 121, 227-233.	7.9	19
66	Deformation-induced Martensite: A New Paradigm for Exceptional Steels. <i>Advanced Materials</i> , 2016, 28, 7753-7757.	21.0	61
67	Microscale Fracture Behavior of Single Crystal Silicon Beams at Elevated Temperatures. <i>Nano Letters</i> , 2016, 16, 7597-7603.	9.1	49
68	Fracture toughness of intermetallic Cu ₆ Sn ₅ in lead-free solder microelectronics. <i>Scripta Materialia</i> , 2016, 123, 38-41.	5.2	26
69	Size and orientation dependent mechanical behavior of body-centered tetragonal Sn at 0.6 of the melting temperature. <i>Acta Materialia</i> , 2016, 115, 76-82.	7.9	20
70	Analysis of the full stress tensor in a micropillar: Ability of and difficulties arising during synchrotron based $\frac{1}{4}$ Laue diffraction. <i>Materials and Design</i> , 2016, 108, 68-75.	7.0	12
71	Are Mo ₂ BC nanocrystalline coatings damage resistant? Insights from comparative tension experiments. <i>Surface and Coatings Technology</i> , 2016, 289, 213-218.	4.8	29
72	Insight into <i>Emiliania huxleyi</i> coccospheres by focused ion beam sectioning. <i>Biogeosciences</i> , 2015, 12, 825-834.	3.3	23

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73	The influence of a brittle Cr interlayer on the deformation behavior of thin Cu films on flexible substrates: Experiment and model. <i>Acta Materialia</i> , 2015, 89, 278-289.	7.9	76
74	In Situ TEM Microcompression of Single and Bicrystalline Samples: Insights and Limitations. <i>Jom</i> , 2015, 67, 1704-1712.	1.9	35
75	Cyclic bending experiments on free-standing Cu micron lines observed by electron backscatter diffraction. <i>Acta Materialia</i> , 2015, 83, 460-469.	7.9	34
76	Internal and external stresses: In situ TEM compression of Cu bicrystals containing a twin boundary. <i>Scripta Materialia</i> , 2015, 100, 94-97.	5.2	45
77	Can microscale fracture tests provide reliable fracture toughness values? A case study in silicon. <i>Journal of Materials Research</i> , 2015, 30, 686-698.	2.6	129
78	Influence of inclined twin boundaries on the deformation behavior of Cu micropillars. <i>Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing</i> , 2015, 642, 65-70.	5.6	27
79	Deformation patterns in cross-sections of twisted bamboo-structured Au microwires. <i>Acta Materialia</i> , 2015, 97, 216-222.	7.9	25
80	Micro-tension study of miniaturized Cu lines at variable temperatures. <i>Acta Materialia</i> , 2015, 92, 243-254.	7.9	13
81	Measuring electro-mechanical properties of thin films on polymer substrates. <i>Microelectronic Engineering</i> , 2015, 137, 96-100.	2.4	43
82	On the reversibility of dislocation slip during small scale low cycle fatigue. <i>Acta Materialia</i> , 2015, 94, 69-77.	7.9	25
83	Adhesion measurement of a buried Cr interlayer on polyimide. <i>Philosophical Magazine</i> , 2015, 95, 1982-1991.	1.6	15
84	Importance of dislocation pile-ups on the mechanical properties and the Bauschinger effect in microcantilevers. <i>Journal of Materials Research</i> , 2015, 30, 791-797.	2.6	36
85	Transition from shear to stress-assisted diffusion of copper in chromium nanolayered thin films at elevated temperatures. <i>Acta Materialia</i> , 2015, 100, 73-80.	7.9	23
86	A new method for polychromatic X-ray $\frac{1}{4}$ Laue diffraction on a Cu pillar using an energy-dispersive pn-junction charge-coupled device. <i>Review of Scientific Instruments</i> , 2014, 85, 113901.	1.3	11
87	Laue Microdiffraction at the ESRF. , 2014, , 156-204.		2
88	Recovery of electrical resistance in copper films on polyethylene terephthalate subjected to a tensile strain. <i>Thin Solid Films</i> , 2014, 552, 141-145.	1.8	26
89	New insights into single-grain mechanical behavior from temperature-dependent 3-D coherent X-ray diffraction. <i>Acta Materialia</i> , 2014, 78, 46-55.	7.9	15
90	Differences in deformation behavior of bicrystalline Cu micropillars containing a twin boundary or a large-angle grain boundary. <i>Acta Materialia</i> , 2014, 73, 240-250.	7.9	120

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91	Ductile film delamination from compliant substrates using hard overlayers. <i>Thin Solid Films</i> , 2014, 571, 302-307.	1.8	22
92	An in-situ high-energy X-ray diffraction study on the hot-deformation behavior of β -phase containing TiAl alloy. <i>Intermetallics</i> , 2013, 39, 25-33.	3.9	39
93	In-situ observation of stress-induced stochastic twin boundary motion in off stoichiometric NiMnGa single crystals. <i>Applied Physics Letters</i> , 2013, 103, 021909.	3.3	9
94	Effects of structure and interfaces on fracture toughness of CrN/AlN multilayer coatings. <i>Scripta Materialia</i> , 2013, 68, 917-920.	5.2	77
95	Advanced nanomechanics in the TEM: effects of thermal annealing on FIB prepared Cu samples. <i>Philosophical Magazine</i> , 2012, 92, 3269-3289.	1.6	48
96	Investigation of reversible plasticity in a micron-sized, single crystalline copper bending beam by X-ray μ Laue diffraction. <i>Philosophical Magazine</i> , 2012, 92, 3231-3242.	1.6	27
97	Expected and unexpected plastic behavior at the micron scale: An in situ μ Laue tensile study. <i>Acta Materialia</i> , 2012, 60, 1252-1258.	7.9	38
98	Sample Preparation by Metallography and Focused Ion Beam for Nanomechanical Testing. <i>Praktische Metallographie/Practical Metallography</i> , 2012, 49, 343-355.	0.3	22
99	Impact of instrumental constraints and imperfections on the dislocation structure in micron-sized Cu compression pillars. <i>Acta Materialia</i> , 2011, 59, 5618-5626.	7.9	51
100	In Situ μ Laue: Instrumental Setup for the Deformation of Micron Sized Samples. <i>Advanced Engineering Materials</i> , 2011, 13, 837-844.	3.5	27
101	Deformation mechanisms in micron-sized PST TiAl compression samples: Experiment and model. <i>Acta Materialia</i> , 2011, 59, 3410-3421.	7.9	38
102	Dislocation storage in single slip-oriented Cu micro-tensile samples: new insights via X-ray microdiffraction. <i>Philosophical Magazine</i> , 2011, 91, 1256-1264.	1.6	43
103	3D strain imaging in sub-micrometer crystals using cross-reciprocal space measurements: Numerical feasibility and experimental methodology. <i>Nuclear Instruments & Methods in Physics Research B</i> , 2010, 268, 388-393.	1.4	6
104	X-ray diffraction analysis of three-dimensional residual stress fields reveals origins of thermal fatigue in uncoated and coated steel. <i>Scripta Materialia</i> , 2010, 62, 774-777.	5.2	26
105	Residual stresses and thermal fatigue in CrN hard coatings characterized by high-temperature synchrotron X-ray diffraction. <i>Thin Solid Films</i> , 2010, 518, 2090-2096.	1.8	27
106	Methodology for studying strain inhomogeneities in polycrystalline thin films during in situ thermal loading using coherent x-ray diffraction. <i>New Journal of Physics</i> , 2010, 12, 035018.	2.9	24
107	Residual stresses in thermally cycled CrN coatings on steel. <i>Thin Solid Films</i> , 2008, 517, 1167-1171.	1.8	19